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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,284	11/15/2001	Dong Wu	56530US002	9016
32692	7590	08/21/2003		7
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER	
			SHOSHO, CALLIE E	
		ART UNIT	PAPER NUMBER	
		1714		

DATE MAILED: 08/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/000,284	WU ET AL.
	Examiner Callie E. Shosho	Art Unit 1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-48 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-48 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2-3</u> .	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 1 and claim 24 each recite that "each X² independently represents" followed by six formulae. However, due to the double use of "or", the scope of the claim is confusing because it is not clear if X² can be represented any of the six structures recited or if X² must be one of the first three structures or one of the second three structures? If the former is true, it is suggested that the first recitation of "or" be deleted.

(b) Claim 1 and claim 24 each recite "wherein each R^A independently represents H, lower alkyl having 1 to 4 carbon atoms, or R¹Y wherein R¹ and Y are previously described." However, the scope of the claims is confusing because there is no previous disclosure of Y in either claim.

(c) Claim 3 recites that the "ink is substantially free of organic solvent". The scope of the claim is confusing because it is not clear what is meant by "substantially". How much organic solvent can the ink possess and still be considered "substantially" free of organic solvent – 0%, 1%, 5%?

(d) Claim 43 recites that the “deformable particles are not substantially swelled by the aqueous vehicle. The scope of the claim is confusing because it is not clear what is meant by “substantially”. How much swelling can occur and still have the deformable particles considered not substantially swelled?

Claim Rejections - 35 USC § 102

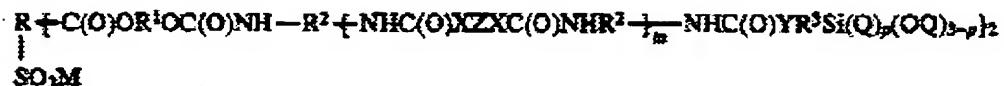
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6-12, 15, and 36-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Krepski et al. '626 (U.S. 5,747,626).

Krepski et al. '626 disclose silyl-terminated sulfopoly(ester-urethane) polymer as well as composition comprising the polymer dispersed in water, pigment, and additional dispersed polymer such as acrylic polymer. The silyl-terminated sulfopoly(ester-urethane) polymer is of the formula:



which, when m is 0, is identical to that presently claimed when m is 1, n is 0, s is 0, R^D is alkylene group, X¹ is OC(O)NH, R² is alkylene group, X² is NHC(O)NH, R³ is alkylene group, and Y is Si(OR⁸)(R⁴) where R⁸ is H or lower alkyl and R⁴ is lower alkyl. The weight percent of the silyl-terminated sulfopoly(ester-urethane) polymer in the final aqueous dispersion is at least 20%. The aqueous dispersion comprises 30% or more solvent such as water or organic solvent. Thus, organic solvent is not required (col.2, lines 1-3 and 15-21, col.4, line 16-col.5, line 33, col.8, lines 30-32, col.11, lines 40-54, col.12, lines 44-62, and example 17). Given that the acrylic resin (Tanol) is present in an amount of 0-5% while the silyl-terminated sulfopoly(ester-urethane) polymer is present in an amount of at least 20%, is calculated that the acrylic resin is present in an amount of, for instance, 0.25 times the amount of acrylic resin.

While there is no disclosure that the composition is an ink jet printable ink as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that "if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the preamble does not state any distinct definition of any of the claimed invention's limitations and further that the purpose or intended use, i.e. ink jet printable ink, recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art composition and further that the prior art structure which is a composition identical to that set forth in the present claims is capable of performing the recited purpose or intended use.

In light of the above, it is clear that Krepski et al. '626 anticipate the present claims.

5. Claims 1-4, 6-12, 15, and 36-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Krepski et al. '160 (U.S. 5,929,160).

Krepski et al. '160 disclose silyl-terminated sulfopoly(ester-urethane) polymer as well as composition comprising the polymer dispersed in water, pigment, and additional dispersed polymer such as acrylic polymer. The composition comprises 20-70% solids. The silyl-terminated sulfopoly(ester-urethane) polymer is of the formula:



which when m is 0, is identical to that presently claimed when m is 1, n is 0, s is 0, R^D is alkylene group, X¹ is OC(O)NH, R² is alkylene group, X² is NHC(O)NH, R³ is alkylene group, and Y is Si(OR⁸)(R⁴) where R⁸ is H or lower alkyl and R⁴ is lower alkyl. The weight percent of

the silyl-terminated sulfopoly(ester-urethane) polymer in the final aqueous dispersion is at least 20%. The aqueous dispersion comprises 30% or more solvent such as water or organic solvent. Thus, organic solvent is not required (col.1, lines 15-18 and 51-58, col.3, lines 20-25, col.4, line 66-col.5, line 4, col.5, line 45-col.7, line 19, col.15, lines 15-32, col.15, line 59-col.16, line 17, and example 16). Given that the acrylic resin (Tamol) is present in an amount of 0-5% while the silyl-terminated sulfopoly(ester-urethane) polymer is present in an amount of up to 70%, is calculated that the acrylic resin is present in an amount of, for instance, 0.07 times or more the amount of acrylic resin.

While there is no disclosure that the composition is an ink jet printable ink as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that "if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the preamble does not state any distinct definition of any of the claimed invention's limitations and further that the purpose or intended use, i.e. ink jet printable ink, recited in the present claims does not result in a structural difference between the

presently claimed invention and the prior art composition and further that the prior art structure which is a composition identical to that set forth in the present claims is capable of performing the recited purpose or intended use.

In light of the above, it is clear that Krepski et al. '160 anticipate the present claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

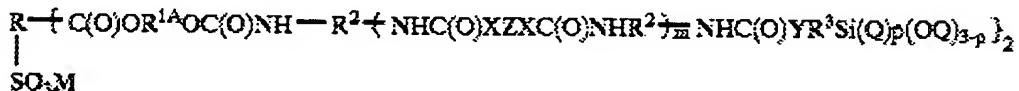
invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-2, 4, 6-9, 15-18, 23-27, and 34-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. (U.S. 5,846,306) in view of Krepski et al. (U.S. 5,939,160).

Kubota et al. disclose ink jet ink comprising aqueous vehicle, pigment, humectant, acrylic resin, and 1-40% polyurethane. There is further disclosed ink set comprising cyan, yellow, and magenta inks. The ink is printed using an ink jet printer wherein the ink is contained in an ink jet cartridge. There is further disclosed a printing process wherein the above ink is jetted onto paper using ink jet printer to form printed article (col.3, lines 57-60, col.5, lines 39-43, col.6, lines 14 and 64-67, col.7, line 42, col.8, line 41, and col.12, lines 54-58).

The difference between Kubota et al. and the present claimed invention is the requirement in the claims of (a) silyl-terminated sulfopoly(ester-urethane) polymer and (b) ink set comprising black ink and white ink.

With respect to difference (a), Krepski et al. '160, which is drawn to coatings for paper, disclose the use of silyl-terminated sulfopoly(ester-urethane) polymer of the formula:



which, when m is 0, is identical to that presently claimed when m is 1, n is 0, s is 0, R^D is alkylene group, X¹ is OC(O)NH, R² is alkylene group, X² is NHC(O)NH, R³ is alkylene group, and Y is Si(OR⁸)(R⁴) where R⁸ is H or lower alkyl and R⁴ is lower alkyl. The silyl-terminated sulfopoly(ester-urethane) polymer is used in order to impart toughness, weatherability, abrasion resistance, and enhanced adhesion to substrate (col.4, line 66-67 and col.5, lines 13-16). Given that Krepksi et al. '160 disclose silyl-terminated sulfopoly(ester-urethane) polymer identical to that presently claimed, it is clear that such polymer would intrinsically be shear deformable and not be substantially swelled by aqueous vehicle.

In light of the motivation for using silyl-terminated sulfopoly(ester-urethane) polymer disclosed by Krepksi et al. '160 as described above, it therefore would have been obvious to one of ordinary skill in the art to use silyl-terminated sulfopoly(ester-urethane) polymer in the ink of Kubota et al. in order to produce ink with good toughness, weatherability, abrasion resistance, and enhanced adhesion, and thereby arrive at the claimed invention.

With respect to difference (b), Kubota et al. disclose ink set comprising three inks. However, there is no disclosure of ink set comprising four or five inks including black ink and white ink as presently claimed.

However, it would have been within the skill level of one of ordinary skill in the art to recognize that depending on the desired colors present in the final image, the end use of the ink, the color of the substrate, etc., additional 1, 2, 3, etc. inks of different colors including black and white would be utilized in order to produce the desired printed image, and thereby arrive at the claimed invention.

9. Claims 1-5, 9-16, 23-25, 27, 31, 34-39, and 42-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu (U.S. 5,889,083) in view of Krepski et al. (U.S. 5,929,160).

Zhu discloses ink jet ink comprising aqueous medium, pigment or dye, humectant, 1-40% polyurethane, and if used, 1-5% organic solvent. The ink has viscosity of 1-10 cP. The ink is printed onto substrate such as paper, glass, and plastic. There is also disclosed a printing process wherein the above ink is jetted onto paper using ink jet printer to form printed article (col.2, line 66-col.3, line 1, col.3, lines 16-28, col.4, line 55, col.6, lines 29 and 33-35, col.9, line 7, and col.10, lines 52-63).

The difference between Zhu and the present claimed invention is the requirement in the claims of silyl-terminated sulfopoly(ester-urethane) polymer.

Krepski et al. '160, which is drawn to coatings for paper, disclose the use of silyl-terminated sulfopoly(ester-urethane) polymer of the formula:



which, when m is 0, is identical to that presently claimed when m is 1, n is 0, s is 0, R^D is alkylene group, X¹ is OC(O)NH, R² is alkylene group, X² is NHC(O)NH, R³ is alkylene group, and Y is Si(OR⁸)(R⁴) where R⁸ is H or lower alkyl and R⁴ is lower alkyl. The silyl-terminated sulfopoly(ester-urethane) polymer is used in order to impart toughness, weatherability, abrasion resistance, and enhanced adhesion to substrate (col.4, line 66-67 and col.5, lines 13-16). Given

that Krepski et al. '160 disclose silyl-terminated sulfopoly(ester-urethane) polymer identical to that presently claimed, it is clear that such polymer would intrinsically be shear deformable and not be substantially swelled by aqueous vehicle.

In light of the motivation for using silyl-terminated sulfopoly(ester-urethane) polymer disclosed by Krepski et al. '160 as described above, it therefore would have been obvious to one of ordinary skill in the art to use silyl-terminated sulfopoly(ester-urethane) polymer in the ink of Zhu in order to produce ink with good toughness, weatherability, abrasion resistance, and enhanced adhesion, and thereby arrive at the claimed invention.

10. Claims 1-2, 4-9, 15-16, 23-25, 27-30, 32-37, 40, and 42-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdtmann et al. (U.S. 6,533,408) in view of Krepski et al. '160 (U.S. 5,929,160).

Erdtmann et al. disclose ink jet ink comprising aqueous medium, pigment, humectant, and 0.1-10% polyurethane. The ink is printed onto substrate such as fabric, paper, plastic or film. There is also disclosed a printing process wherein the above ink is jetted onto paper using piezoelectric ink jet printer to form printed article (col.1, lines 16-20, col.2, lines 65-67, col.3, lines 10-19, col.4, line 19, col.5, lines 1-3, col.5, line 67-col.6, line 1, col.8, lines 51-53, col.9, lines 27-44, and col.15, lines 28-30).

The difference between Erdtmann et al. and the present claimed invention is the requirement in the claims of silyl-terminated sulfopoly(ester-urethane) polymer.

Krepski et al. '160, which is drawn to coatings for paper, disclose the use of silyl-terminated sulfopoly(ester-urethane) polymer of the formula:



which, when m is 0, is identical to that presently claimed when m is 1, n is 0, s is 0, R^D is alkylene group, X¹ is OC(O)NH, R² is alkylene group, X² is NHC(O)NH, R³ is alkylene group, and Y is Si(OR⁸)(R⁴) where R⁸ is H or lower alkyl and R⁴ is lower alkyl. The silyl-terminated sulfopoly(ester-urethane) polymer is used in order to impart toughness, weatherability, abrasion resistance, and enhanced adhesion to substrate (col.4, line 66-67 and col.5, lines 13-16). Given that Krepski et al. '160 disclose silyl-terminated sulfopoly(ester-urethane) polymer identical to that presently claimed, it is clear that such polymer would intrinsically be shear deformable and not be substantially swelled by aqueous vehicle.

In light of the motivation for using silyl-terminated sulfopoly(ester-urethane) polymer disclosed by Krepski et al. '160 as described above, it therefore would have been obvious to one of ordinary skill in the art to use silyl-terminated sulfopoly(ester-urethane) polymer in the ink of Erdtmann et al. in order to produce ink with good toughness, weatherability, abrasion resistance, and enhanced adhesion, and thereby arrive at the claimed invention.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Maksymkiw et al. (U.S. 5,523,344) disclose water-based adhesive comprising sulfonated polyester polyurethane, however, there is no disclosure that the polymer is silyl-terminated.

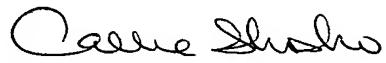
Larson (U.S. 5,756,633) disclose silyl-terminated sulfopoly(ester-urethane) identical to that presently claimed, however, there is no disclosure of ink.

Kincaid et al. (U.S. 6,139,594) disclose silyl-terminated sulfopoly(ester-urethane) identical to that presently claimed, however, there is no disclosure of ink.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
8/14/03